



Pressure Sensitive Regulating Unloader

Models **7670**
 7672
 7690

FEATURES

- Provides system pressure setting and protection for single gun and pump (non-weep) installation.
- Compact size with optional ports for easy installation.
- New ergonomic handle permits easy adjustments of pressure.
- Pressure sensitive feature permits wide range of flows and immediate pressure when gun opens.
- Color coded spring for easy identification and simple change from one model to another.

SPECIFICATIONS

	U.S. Measure	Metric Measure
MODEL 7670		
Flow Range	2.5-8.0 GPM	(9.5-30 L/M)
Pressure Range	150-1450 PSI	(10-100 BAR)
Intermittent.....	1750 PSI	(120 BAR)
Weight	1.66 lbs.	(0.77 kg)
Dimensions	7.0 x 3.12 x 2.0"	(178 x 79 x 51 mm)
MODEL 7672		
Flow Range	2.5-8.0 GPM	(9.5-30 L/M)
Pressure Range	850-3200 PSI	(60-220 BAR)
Intermittent.....	3500 PSI	(245 BAR)
Weight	1.71 lbs.	(0.78 kg)
Dimensions	7.0 x 3.12 x 2.0"	(178 x 79 x 51 mm)
MODEL 7690		
Flow Range	2.5-8.0 GPM	(9.5-30 L/M)
Pressure Range	1000-4050 PSI	(70-275 BAR)
Intermittent.....	4350 PSI	(300 BAR)
Weight	1.71 lbs.	(0.78 kg)
Dimensions	7.0 x 3.12 x 2.0"	(178 x 79 x 51 mm)
COMMON SPECIFICATIONS		
Maximum Temperature	195°F	(90°C)
Inlet Port (2).....	3/8" NPTF	(3/8" NPTF)
Discharge Port (1)	3/8" NPTF	(3/8" NPTF)
By-Pass Port (2).....	3/8" NPTF	(3/8" NPTF)

“Customer confidence is our greatest asset”

SELECTION: This is a pressure sensitive **regulating unloader**. It is designed for systems with a **single** pump, solenoid (gate) valve, nozzle, and standard gun. **“Weep” guns are not recommended with this unloader.**

This unloader holds established system pressure in the discharge line when the trigger gun is closed or solenoid (gate) valve is closed or the nozzle is clogged, by-passing the unrequired flow. It returns to established system pressure without delay upon squeezing the trigger gun or opening the solenoid (gate) valve.

NOTE: For **multiple pump** systems, it is best to use a pressure regulator not an unloader.

Select the specific model of unloader to meet both the desired system flow (combined nozzle flow rate requirement) and the desired system pressure.

Exercise caution when matching the system requirements to the unloader flow capacity and pressure rating. Operation below the minimum flow of the unloader causes the unloader to cycle. Operation beyond the rated unloader flow causes premature valve wear, unloader cycling and prevents attaining desired system pressure.

Select a high pressure nozzle sized to provide for both the desired **system flow** and pressure and **unloader by-pass**.

CAUTION

A MINIMUM BY-PASS FLOW of 5% of the UNLOADER RATED FLOW CAPACITY is required for proper unloader performance.

When properly set this unloader protects the pump from pressure extremes associated with obstructions in the discharge line, while maintaining the established system pressure. When no flow is required by the system, the unloader by-passes all the system flow and relieves the load on the pump. Pressure is held in the discharge line (between the unloader and gun or solenoid valve) ready for a quick return to high pressure operation.

INSTALLATION: This unloader operates properly when mounted in any direction, however, it is preferred to keep the plumbing to a minimum and the adjusting nut easily accessible. The best location is directly on the pump discharge manifold head. Plumbing to and from the unloader should be at least the size of the unloader ports and flexible, high pressure hose (minimum single wire braid) is required.

This is a flow through design unloader. The standard **inlet connection** of the 7670, 7672 and 7690 is at the **back** with an alternate port on the bottom. The unloader can be mounted directly in the discharge line. The unloader should be mounted on the discharge manifold with the discharge line plumbed into the unloader discharge port.

The **by-pass connection** is on the **side** of the unloader and can be plumbed in one of the following methods. Note that prolonged by-pass can result in significant heat build-up and frequent by-pass can result in premature wear to the valve. A **MINIMUM BY-PASS OF 5%** is necessary for the unloader to operate properly.

CAUTION

If the entire output is directed through the unloader (zero by-pass) the “cushioning” feature of the by-pass fluid is eliminated and the unloader can malfunction or wear prematurely.

Check the amount of by-pass by disconnecting the by-pass line and measuring the flow into a graduated container.

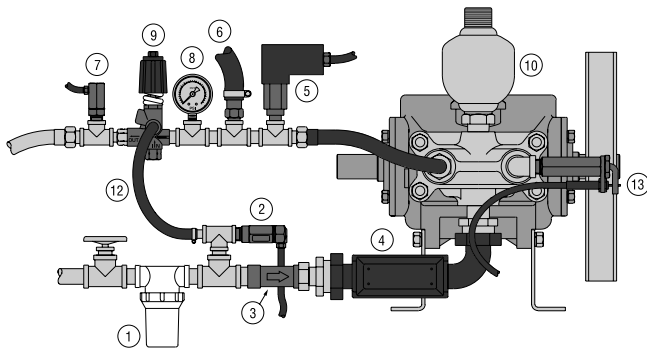
By-Pass to Reservoir: Ideally the by-pass line should be directed to a reservoir with at least one baffle between the supply line to the pump (from the reservoir) and the return by-pass line (from the unloader into the reservoir). This baffle minimizes turbulence and air bubbles that could enter the pump inlet feed line. **The reservoir capacity should be 6 to 10 times the rated system flow per minute.**

By-Pass to Pump Inlet: Although not recommended, by-pass fluid can be returned to the inlet line of the pump or directly to a pump inlet port (**systems up to 10 GPM**). When using this method an *Inlet Pressure Regulator* should be installed on the inlet line to avoid excessive inlet pressure. Be certain the *Inlet Pressure Regulator* is **between** the pump inlet and the by-pass line connection. When using this method, a *Thermo Valve* should be installed in the by-pass line to protect the pump from temperature build-up and premature seal failure.

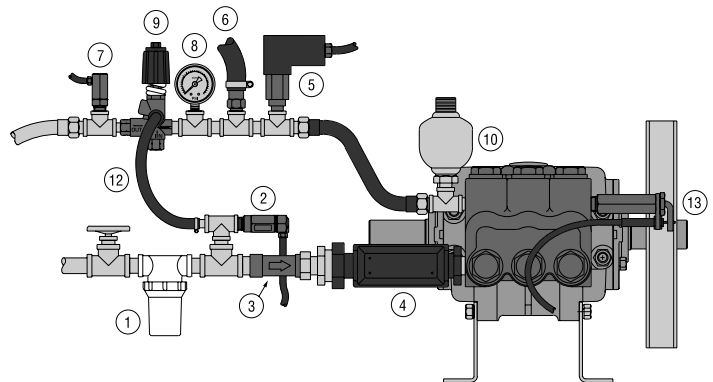
The by-pass line should be **connected to the pump inlet line at a gentle angle of 45° or less and no closer than 10 times the pump inlet port diameter** e.g. 1-1/2" port size = 15" distance from pump inlet port. **Refer to Technical Bulletin 64 for additional information on the size and length of the by-pass line.**

TYPICAL INSTALLATION

Piston Pump



Plunger Pump



By-Pass to Drain: If the by-pass is limited and infrequent, the by-pass can easily drain to an unpressurized drain line (to the ground).

The **outlet connection** is located at the **front** of the unloader and marked with an arrow. Plumbing for the spray gun, nozzle or solenoid valve should be connected in from this discharge port.

It is recommended that a secondary protective device such as the *CAT PUMP Pop-Off Valve* be installed to assure pump protection should the unloader malfunction. Refer to Troubleshooting for more information on malfunction of unloader.

Preferred mounting of the *Prrrrr-o-lator* (pulsation dampener) is directly **on the Discharge Manifold Head**. When using an *Inlet Pressure Regulator*, mount the *Prrrrr-o-lator* **downstream from the unloader** to assure optimum performance of the regulator.

CAUTION

Oversizing the *Prrrrr-o-lator* may cause delayed response from the unloader.

PRESSURE ADJUSTMENT: Setting and adjusting the unloader pressure must be done with the system “on”. Start the system with the unloader backed off to the **lowest pressure** setting. Squeeze the trigger and read the pressure on the gauge at the pump. If more pressure is desired, release the trigger, turn adjusting nut one quarter turn, squeeze the trigger and read the pressure. Repeat this process until desired pressure is attained. Pressure fluctuation from this established system pressure is minimal with the opening of each additional gun.

Monitor the by-pass flow at each adjustment. If the by-pass flow, drops below 5% of rated unloader flow, STOP ADJUSTMENT. The nozzle selection is improperly sized to achieve the desired system pressure.

Proceed by accepting the attained pressure OR selecting a smaller nozzle OR increasing the pump RPM providing you stay within specifications.

Once the desired system pressure is reached, stop adjusting and set the top locking nut to hold the system pressure. **Do not read the pressure at the gun or nozzle for setting system pressure.** Check the nozzle as part of regular maintenance and replace if worn. **Do not adjust unloader pressure setting to compensate for a worn nozzle.**

- | | |
|---|-------------------------------|
| 1 Inlet Filter | 7 Quick Start Valve |
| 2 Thermo Valve | 8 Pressure Gauge |
| 3 Inlet Pressure Regulator | 9 Pressure Regulator/Unloader |
| 4 C. A.T. Tube
(Captive Acceleration Tube) | 10 Pulsation Dampener★ |
| 5 Pressure Switch | 11 Chemical Injector |
| 6 Pop-Off Valve | 12 By-pass Hose |
| | 13 Throttle Controller |

★ Preferred mounting of Pulsation Dampener [Prrrrr-O-Lator] is directly on the discharge manifold of the pump. The preferred mounting of the by-pass hose [when returning to the inlet] is before the Pressure Reducing Valve. If this is not possible, then mount the Prrrrr-O-Lator after the Pressure Unloading Valve to prevent pressure spikes to the pump inlet.

Approximate Pressure Reading at Gauge	Gauge Between Pump/Unloader	Gauge Between Unloader/Gun-Nozzle-Valve
System in operation (gun open)	system pressure	system pressure
System in by-pass (gun closed)	low pressure 0-150 PSI	system pressure +200 PSI

TROUBLESHOOTING

Unloader cycles	<ul style="list-style-type: none"> ● Worn O-ring or check valve ● Fitting leaking downstream ● O-ring in gun worn
Fluid leaking from bottom	<ul style="list-style-type: none"> ● O-ring for seat or inlet fitting cut or worn
Fluid leaking from middle	<ul style="list-style-type: none"> ● O-ring for piston worn or cut
Unloader will not come up to pressure	<ul style="list-style-type: none"> ● Not properly sized for system pressure ● Foreign material in unloader ● Piston o-rings worn ● Nozzle worn
Extreme pressure spikes	<ul style="list-style-type: none"> ● Adjusting nut turned completely into unloader ● Restricted by-pass or no by-pass ● System flow exceeds unloader rating

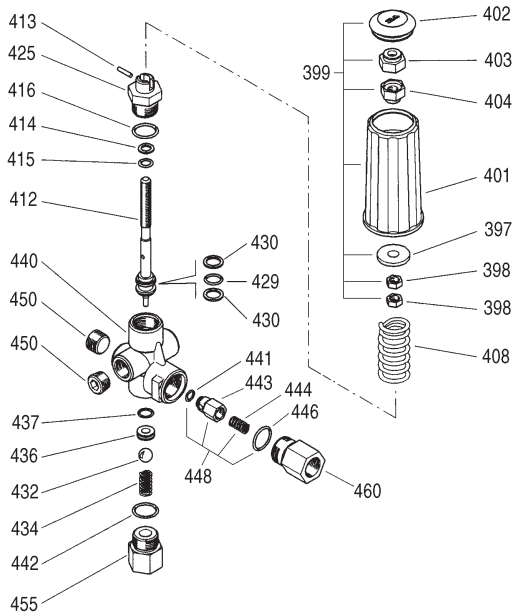
WARRANTY

90 Day Warranty

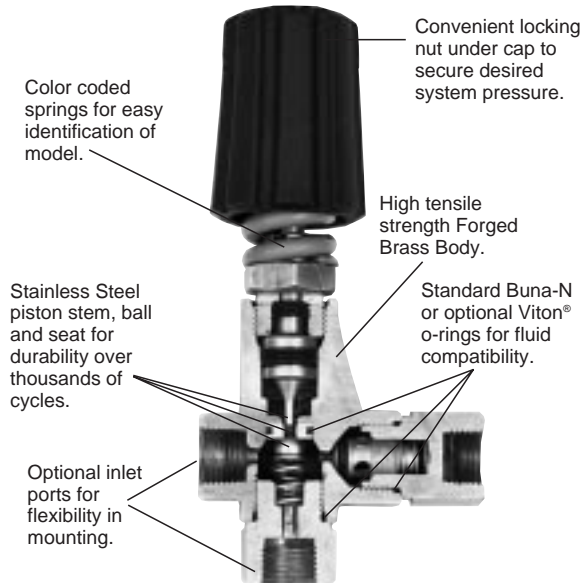
Refer to complete Cat Pump Warranty for further information.

These illustrations show the basic elements for a typical installation of a high pressure piston or plunger pump. **Not all components shown are required for all applications or systems.** Each component presents potential problems that too often are ascribed to a perfectly functioning pump, such as: a clogged strainer, a partially closed shut-off valve, a faulty gauge, or a malfunctioning regulator/unloader. Proper system installation, routine lubrication, monitoring and maintenance of components are your basic guarantees of optimum pump performance. CAT PUMPS does not assume any liability or responsibility for the design or operation of a customer’s high pressure system.

EXPLODED VIEW



CUTAWAY



PARTS LIST

ITEM	DESCRIPTION	MODEL NUMBER						QTY
		7670	MATL	7672	MATL	7690	MATL	
397	Washer, Handle	33633	STZP	33633	STZP	33633	STZP	1
398	Nut, Jam (M8)	32116	STZP	32116	STZP	32116	STZP	2
399	Assembly, Complete Handle (Incls: 397, 398, 401, 402, 403, 404)	31395	NY	31395	NY	31395	NY	1
401	Handle	31284	NY	31284	NY	31284	NY	1
402	Cap, Handle	31286	NY	31286	NY	31286	NY	1
403	Nut, Hex, NY Lock (M8)	32811	STZP	32811	STZP	32811	STZP	1
404	Insert, Nut	31287	STZP	31287	STZP	31287	STZP	1
408	Spring, White (1450 PSI)	32090	STL	—	—	—	—	1
	Spring, Blue (3450 PSI)	—	—	32092	STL	32092	STL	1
412	Stem, Piston	33219	S	33219	S	33219	S	1
413	Pin, Piston, Lock	32818	S	32818	S	32818	S	1
414	Back-up-Ring, Piston Stem	32873	PTFE	32873	PTFE	32873	PTFE	1
415	O-Ring, Piston Stem	33572	FPM	33572	FPM	33363	NBR	1
416	O-Ring, Retainer	32113	NBR	32113	NBR	33043	NBR	1
	O-Ring, Retainer	33567	FPM	33567	FPM	33567	FPM	1
425	Retainer, Piston	33318	BB	33318	BB	33318	BB	1
429	O-Ring, Piston	32919	NBR	32919	NBR	31299	NBR	1
430	Back-up-Ring, Piston	33303	PTFE	33303	PTFE	33303	PTFE	2
432	Ball, 11/32"	32289	S	32289	S	31072	S	1
434	Spring	33781	STZP	33781	STZP	33781	STZP	1
436	Seat	33640	S	33640	S	33862	S	1
437	O-Ring, Seat - 85	32008	NBR	32008	NBR	32008	NBR	1
	O-Ring, Seat	33562	FPM	33562	FPM	33562	FPM	1
440	Body	—	BB	—	BB	—	BB	1
441	O-Ring, Check Valve	32851	NBR	32851	NBR	33288	NBR	1
	O-Ring, Check Valve	33580	FPM	33580	FPM	33580	FPM	1
442	O-Ring, Inlet Fitting	32113	NBR	32113	NBR	33043	NBR	1
443	Check Valve	33852	BB	33852	BB	33852	BB	1
444	Spring, Check Valve	33843	S	33843	S	33843	S	1
446	O-Ring, Discharge Fitting	33044	NBR	33044	NBR	33044	NBR	1
	O-Ring, Discharge Fitting	31324	FPM	31324	FPM	31324	FPM	1
448	Assembly, Check Valve (Incls: 441, 443, 444, 446)	31370	BB	31370	BB	31371	BB	1
450	Plug, Inlet (3/8" NPT)	46690	BB	46690	BB	46690	BB	1
455	Fitting, Inlet (3/8" NPT)	32111	BB	32111	BB	31211	BB	1
458	Kit, Valve (Incls: 432, 434, 436, 437, 442)	33147	BB	33147	BB	31147	BB	1
460	Fitting, Discharge (3/8" NPT)	33855	BB	33855	BB	33855	BB	1
468	Kit, O-Ring (Incls: 414, 415, 416, 429, 430, 437, 441, 442, 446)	31365	NBR	31365	NBR	31366	NBR	1
	Kit, O-Ring (Incls: 414, 415, 416, 429, 430, 437, 441, 442, 446)	31375	FPM	31375	FPM	31375	FPM	1

Bold print part numbers are unique to a particular model. Italics are optional items.

MATERIAL CODES (Not Part of Part Number): BB=Brass FPM=Fluorocarbon (Viton®) NBR=Medium Nitrile (Buna-N)

NY=Nylon PTFE=Polytetrafluoroethylene (Teflon®) S=304SS STL=Steel STZP=Steel/Zinc Plated

Products described hereon are covered by one or more of the following U.S. patents 3558244, 3652188, 3809508, 3920356, 3930756 and 5035580

Mar 1999 2974

World Headquarters

CAT PUMPS

1681 - 94th Lane N.E. Minneapolis, MN 55449-4324

Phone (612) 780-5440 — FAX (612) 780-2958

e-mail: sales@catpumps.com

www.catpumps.com

International Inquiries

FAX (612) 785-4443

e-mail: intlsales@catpumps.com



The Pump with "Nine Lives"

CAT PUMPS (U.K.) LTD.

1 Fleet Business Park, Sandy Lane, Church Crookham, Fleet

Hampshire GU13 0BF, England

Phone Fleet 44 1252-622031 — Fax 44 1252-626655

N.V. CAT PUMPS INTERNATIONAL S.A.

Heiveldekens 6A, 2550 Kontich, Belgium

Phone 32-3-450.71.50 — Fax 32-3-450.71.51

e-mail: cpi@catpumps.be

CAT PUMPS DEUTSCHLAND GmbH

Buchwiese 2, D-65510 Idstein, Germany

Phone 49 6126-93030 — Fax 49 6126-930333

e-mail: catpumps@t-online.de